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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,439	12/05/2001	Ye-Yi Wang	M61.12-0399	3367

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EXAMINER	
SKED, MATTHEW J	

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/007,439	WANG ET AL.	
	Examiner	Art Unit	
	Matthew J. Sked	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-32 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 05 December 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/12/02.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 3 and 7 is objected to because of the following informalities: on line 5 of claim 3, "provided" should be changed to –provide—and on line 3 of claim 7 "pluralities" should be changed to –plurality–.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-5, 7-11, 14, 17-23, 25, 26, 28, 29 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gavalda et al. ("Growing Semantic Grammars") in view of Wang ("A Robust Parser for Spoken Language Understanding"), cited by the applicant.

As per claim 1, Gavalda teaches a method of building a learned grammar for an application, comprising:

generating a semantic schema for the application, the semantic schema having associated semantic constraints (developer creates a domain model with the aid of the DM editor, page 452, section 3.1, 1st paragraph);

generating a template grammar based on the semantic schema such that the template grammar inherits the semantic constraints associated with the semantic schema (generates grammar rules from a rule template derived from the domain model, page 452, section 3.1, 2nd paragraph); and

building the learned grammar by parsing training expressions using the template grammar (uses grammar rules to create parse trees from unseen expressions and uses user interaction to adapt the grammar, page 453, section 3.2.1).

Gavalda does not teach building a context free grammar.

Wang teaches a method of building a context free grammar from semantic class rules (section 2, 1st paragraph).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the algorithm of Gavalda to build context free grammars as taught by Wang because context free grammars are easier to maintain and update and can be used to automatically construct an efficient parser.

4. As per claim 2, Gavalda teaches obtaining a training expression (sentences must inherently be obtained to process, page 453, section 3.2.1).

5. As per claim 3, Gavalda teaches providing an annotated training expression by annotating the training expression against the semantic schema to provide one or more anchor points that are known correct alignments between the training expression and one or more preterminals in the template grammar (maps the sequence of words to its desired semantic representation hence an annotation of the text and presents the user

rephrases of the utterance hence there must inherently be a word or concept (anchor point) that links these rephrases, section 3.2.1).

6. As per claim 4, Gavalda teaches parsing the annotated expression to produce a parse result that complies with the anchor points (user's selection is already parsed and would inherently comply with the anchor point linking the hypotheses, section 3.2.1).

7. As per claim 5, Gavalda teaches learning alignments for a remainder of the training expression, other than portions aligned at the anchor points, with the template CGF (dynamically creates the new grammar, because the grammar already created hypotheses with the anchor point it would not need to learn the anchor point, section 3.2.1).

8. As per claim 7, Gavalda teaches identifying as ambiguities a plurality of different potential alignments of words in the training expression with preterminals in the template CFG (identifies multiple hypotheses, section 3.2.1).

9. As per claim 8, Gavalda teaches providing an output query to a user, the output query prompting a clarifying user input to disambiguate the ambiguities and receiving the clarifying user input (user selects correct alignment from multiple hypotheses, section 3.2.1).

10. As per claim 9, Gavalda teaches providing the potential alignments as a plurality of user selectable alignment options (multiple hypotheses, section 3.2.1).

11. As per claim 10, Gavalda teaches parsing the training expression to produce a parse result, displaying an abstraction of the parse result and receiving a correction input, indicative of a user correction to the parse result (presents ranked hypotheses of

parse trees to the user which allows the user to choose a rephrase of the original parse hence a correction and adds this correction to the grammar, page 453, section 3.2.1).

12. As per claim 11, Gavalda teaches the correction input annotates at least one anchor point that is a known correct alignment between the training expression and a preterminal in the template grammar (annotates the new rule with the learning episode, section 3.2.1).

13. As per claim 14, Gavalda teaches learning a user grammar and storing it on the system (Fig. 1).

Gavalda does not specifically teach associating this user grammar with the template grammar.

However, the Examiner takes Official Notice that modifying a template grammar by a user grammar is notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda to associate the template and pre-existing user grammar because it would generate a functional grammar focused to the particular user hence giving a more robust grammar.

14. As per claim 15, Gavalda and Wang do not teach selecting one from a plurality of available library grammars.

However, the Examiner takes Official Notice that having multiple grammars for multiple users is notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of

Gavalda and Wang to select one from a plurality of grammars because this would allow a grammar specified for a user to be user hence giving better recognition results.

Gavalda and Wang do not teach operating the selected library grammar in a generative mode to generate at least one example of an expression supported by the selected library grammar.

However, the Examiner takes Official Notice that generating text from grammars is notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda and Wang to operate the selected library grammar in a generative mode to generate at least one example of an expression supported by the selected library grammar because it would display to the user an example of what the grammar can process hence informing the user of the function of the grammar.

15. As per claims 17 and 20, Gavalda teaches a method and system for building a learned grammar comprising:

generating a semantic schema for the learned grammar (developer creates a domain model with the aid of the DM editor, page 452, section 3.1, 1st paragraph);

obtaining a template grammar (generates grammar rules from a rule template derived from the domain model, page 452, section 3.1, 2nd paragraph);

receiving a training expression (sentences must inherently be received to process, page 453, section 3.2.1);

providing an annotated expression by annotating the training expression against the semantic schema to provide at least one anchor point that is a known correct

alignment between a portion of the training expression and the template grammar (maps the sequence of words to its desired semantic representation hence an annotation of the text and presents the user rephrases of the utterance hence there must inherently be a word or concept (anchor point) that links these rephrases, section 3.2.1);

parsing the annotated expression to provide a parse result that complies with the anchor point (user's selection is already parsed and would inherently comply with the anchor point linking the hypotheses, section 3.2.1); and

building the learned grammar based on the parse result (uses grammar rules to create parse trees from unseen expressions and uses user interaction to adapt the grammar, page 453, section 3.2.1).

Gavalda does not teach building a context free grammar.

Wang teaches a method of building a context free grammar from semantic class rules (section 2, 1st paragraph).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the algorithm of Gavalda to build context free grammars as taught by Wang because context free grammars are easier to maintain and update and can be used to automatically construct an efficient parser.

16. As per claim 18, Gavalda teaches generating the template grammar based on the semantic schema (generates grammar rules from a rule template derived from the domain model, page 452, section 3.1, 2nd paragraph) and parsing the annotated

expression with the grammar (parses the sentences with the grammar rules, sections 3.2.1).

17. As per claim 19, Gavalda teaches learning alignments for a remainder of the training expression, other than portions aligned at the anchor points, with the template CGF (dynamically creates the new grammar, because the grammar already created hypotheses with an anchor point it would not need to learn the anchor point, section 3.2.1).

18. As per claim 21, Gavalda teaches learning a user grammar and storing it on the system (Fig. 1).

Gavalda does not specifically teach associating this user grammar with the template grammar.

However, the Examiner takes Official Notice that modifying a template grammar by a user grammar is notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda to associate the template and pre-existing user grammar because it would generate a functional grammar focused to the particular user hence giving a more robust grammar.

19. As per claim 22, Gavalda and Wang do not teach operating the selected library grammar in a generative mode to generate at least one example of an expression supported by the selected library grammar.

However, the Examiner takes Official Notice that generating text from grammars is notoriously well known in the art. Therefore, it would have been obvious to one of

ordinary skill in the art at the time of invention to modify the system of Gavalda and Wang to operate the selected library grammar in a generative mode to generate at least one example of an expression supported by the selected library grammar because it would display to the user an example of what the grammar can process hence informing the user of the function of the grammar.

20. As per claim 23, Gavalda teaches the learner is configured to resolve ambiguities in the parse result by prompting the user for additional alignment inputs, in addition to the anchor point, to align the expression with the template grammar (user paraphrases the original utterance, page 454, section 3.2.4).

21. As per claim 25, Gavalda teaches a method of generating a context free grammar (CFG), comprising:

generating an underspecified template grammar (generates grammar rules from a rule template derived from the domain model which are underspecified, page 452, section 3.1, 2nd paragraph);

annotating a training expression, against an abstraction of the template grammar, with one or more anchor points aligning portions of the training expression with preterminals in the grammar (maps the sequence of words to its desired semantic representation hence an annotation of the text and presents the user rephrases of the utterance hence there must inherently be a word or concept (anchor point) that links these rephrases, section 3.2.1);

parsing the training expression with the template grammar to provide a parse result, given the anchor points (user's selection is already parsed and would inherently comply with the anchor point linking the hypotheses, section 3.2.1);

learning alignments of the training expression with the template grammar, in addition to the anchor points (dynamically creates the new grammar, because the grammar already created hypotheses with an anchor point it would not need to learn this, section 3.2.1); and

adding grammar rules to the template grammar to reflect the learned alignment and anchor points (adds new grammar rules to the grammar, section 3.2.1).

Gavalda does not teach building a context free grammar.

Wang teaches a method of building a context free grammar from semantic class rules (section 2, 1st paragraph).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the algorithm of Gavalda to build context free grammars as taught by Wang because context free grammars are easier to maintain and update and can be used to automatically construct an efficient parser.

22. As per claim 26, Gavalda teaches receiving user correction inputs indicative of a user correction of the parse result (presents ranked hypotheses of parse trees to the user which allows the user to choose a rephrase of the original parse hence a correction and adds this correction to the grammar, page 453, section 3.2.1).

23. As per claim 28, Gavalda teaches using the user correction of the parse result as an anchor point (annotates the new rule with the learning episode, section 3.2.1).

24. As per claim 29, Gavalda teaches identifying ambiguities in the parse result and prompting the user alignment inputs to disambiguate the ambiguities (user selects correct alignment from multiple hypotheses, section 3.2.1).

25. As per claim 32, Gavalda teaches method of generating a grammar for an application in an application domain, comprising:

generating an underspecified template grammar (generates grammar rules from a rule template derived from the domain model which are underspecified, page 452, section 3.1, 2nd paragraph);

annotating a training expression against the schema instead of the template grammar, identifying one or more points of alignment between the training expression and the template grammar (maps the sequence of words to its desired semantic representation hence an annotation of the text and presents the user rephrases of the utterance hence there must inherently be a word or concept (anchor point) that links these rephrases, section 3.2.1);

parsing the training expression with the template grammar to provide a parse result that complies with the points of alignment (user's selection is already parsed and would inherently comply with the anchor point linking the hypotheses, section 3.2.1);

learning alignments of the training expression with the grammar (dynamically creates the new grammar, because the grammar already created hypotheses with an anchor point it would not need to learn this, section 3.2.1); and

adding new grammar rules to the template grammar to reflect the learning alignments (adds new grammar rules to the grammar, section 3.2.1).

Gavalda does not teach building a context free grammar.

Wang teaches a method of building a context free grammar from semantic class rules (section 2, 1st paragraph).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the algorithm of Gavalda to build context free grammars as taught by Wang because context free grammars are easier to maintain and update and can be used to automatically construct an efficient parser.

Gavalda does not teach displaying a schema of the application domain instead of the grammar.

However, the Examiner takes Official Notice that displaying semantic representations to the user is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda to display a schema of the application domain because it would allow the user to view the semantic representations to decide if they need to be modified.

26. Claims 6, 13, 16, 24, 27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gavalda in view of Wang and taken in further view of Monaco (U.S. Pat. 6,434,523).

As per claims 6, 24 and 27, Gavalda and Wang do not teach obtaining a set of preselected syntactic constraints and employing the syntactic constraints to learn alignments for the remainder of the training expression.

Monaco teaches a system for creating and editing grammars that learns grammars by parsing the training text according to preselected syntax (col. 5, lines 59-66).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda and Wang to obtain a set of preselected syntactic constraints and employ the syntactic constraints to learn alignments for the remainder of the training expression as taught by Monaco because it would take the parts of speech of the words into consideration hence allowing the grammar to differentiate between multiple meaning words.

27. As per claim 12, Gavalda and Wang do not teach receiving a selection input selecting an incorrectly aligned portion of the training expression in the parse result; receiving a movement input indicative of a user dragging the incorrectly aligned portion to a correct object in the abstraction of the parse result; and receiving a placement input indicative of a user dropping the incorrectly aligned portion on the correct object in the abstraction of the parse result.

Monaco teaches receiving a selection input selecting an incorrectly aligned portion of the training expression in the parse result (graphical object generator allows the user to move objects to change relationships between expressions hence suggesting they would be incorrect, col. 6, lines 17-43);

receiving a movement input indicative of a user dragging the incorrectly aligned portion to a correct object in the abstraction of the parse result and receiving a

placement input indicative of a user dropping the incorrectly aligned portion on the correct object in the abstraction of the parse result (drag and drop, col. 6, lines 17-43).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda and Wang to receive a selection input selecting an incorrectly aligned portion of the training expression in the parse result, receive a movement input indicative of a user dragging the incorrectly aligned portion to a correct object in the abstraction of the parse result and receive a placement input indicative of a user dropping the incorrectly aligned portion on the correct object in the abstraction of the parse result because, as taught by Monaco, it would facilitate the creating and editing of grammars (col. 1, lines 60-63).

28. As per claim 13, Gavalda, Wang and Monaco do not teach reparsing the training expression to produce a new parse result that complies with the anchor point and displaying a new abstraction of the new parse result.

However, the Examiner takes Official Notice that reprocessing data on just learned data is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda, Wang and Monaco to reparse the training expression to produce a new parse result that complies with the anchor point and display a new abstraction of the new parse result because it would display to the user how well the modifications to the grammar affected its performance hence facilitating the user's choice if more training needs to be completed.

29. As per claims 16 and 31, Gavalda and Wang do not teach simultaneously displaying an indication of the semantic schema and an indication of available library grammars, selecting one of the library grammars dragging the selected library grammar to a desired place in the semantic schema, dropping the selected library grammar and associating the selected library grammar with the template grammar.

Monaco teaches displaying both a library of grammars and a representation of the semantic schema (list of grammars and semantic definitions in the display of the selected grammar, Fig. 16) and teaches the use of drag and drop routines to change relationships between expressions, col. 6, lines 17-43).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Gavalda and Wang to display an indication of the semantic schema and an indication of available library grammars, select one of the library grammars, drag the selected library grammar to a desired place in the semantic schema, drop the selected library grammar and associate the selected library grammar with the template grammar as taught by Monaco because it would facilitate the editing of the grammars.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Russell (U.S. Pat. Pub. 2002/0156616A1) teaches building semantic grammars from a template grammar and semantic schema. Huang et al. ("MIPAD : A Next Generation PDA Prototype") teaches creating CFGs on portable

devices. Kendall et al. (U.S. Pat. 5,995,918) teaches a graphical system for building grammars. Arai et al. (U.S. Pat. 6,173,261), Sundaresan (U.S. Pat. 6,336,214), Schmid et al. (U.S. Pat. Pub. 2002/0099535A1), and Zadrozny et al. (U.S. Pat. 5,937,385) teach alternative methods of building grammars.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MS
07/19/05

SUSAN MCFADDEN
PRIMARY EXAMINER